Space Weather Forecast

Issued on Friday, 10 February 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares expected.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity was observed, with six Moderate-class flares in the last 24 hours, some of which were double peaked. The largest flare was from a spot in the northwest. This spot persists as a moderately sized region, with a complex magnetic structure. A spot in the southeast has also shown activity in the past 24 hours, it's magnetic structure remains difficult to assess, yet it currently appears to have a moderately complex magnetic structure. The other regions are generally simpler and more stable, with no current significant growth. There are a total of nine numbered regions on the disc, and one yet to be numbered. A couple of coronal mass ejections were observed from the flares, however these are off the Earth-Sun line, with no Earth-directed component expected.

Solar Wind / Geomagnetic Activity: Solar winds perhaps showed a very weak, glancing coronal mass ejection influence. Observed speeds fluctuated between slightly elevated and elevated. Total interplanetary magnetic field strength was mainly weak but became persistently southward directed between 09/1700-10/0130 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 2-3), but with Active intervals (Kp 4) between 09/2100-10/0300 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles is at Background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity expected with further Moderate class flares likely from either of the two larger and complex sunspot groups. There is a slight chance of Strong flares.

Solar Wind / Geomagnetic Activity: CMEs which left the Sun on the 5th and 7th, while forecast to miss the Earth, give a low chance of glancing interactions on days 1 and 2 (10th and 11th). Otherwise current slightly elevated solar winds are expected to erratically ease, with no other significant enhancements expected. Geomagnetic activity is forecast to be mostly Quiet with Unsettled intervals, but with a chance of Active, and very slight chance of G1 Minor Storms, day 1-2 (10th and 11th) due to any CME arrival that may occur.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background, but there is a very slight chance of this increasing towards the S1/Minor radiation storm level in response to any significant flares that occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	70	60	60
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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